ROLLER CONE BITS WITH WEAR AND FRACTURE RESISTANT SURFACE

ABSTRACT OF THE DISCLOSURE

Roller cone bits include a steel bit body having a leg extending therefrom. A steel cone is disposed on the leg and includes steel cutting elements projecting outwardly therefrom. One of the cutting elements comprises a steel base integral with the cone and that projects therefrom. A cutting element end is attached to the base portion and extends to form a cutting element tip. The base and end portions are attached when the cone base are in a preexisting rigid state. The end portion comprises a wear resistant material having a material microstructure comprising a first phase of grains selected from the group of carbides, borides, nitrides, and carbonitrides of W, Ti, Mo, Nb, V, Hf, Ta, and Cr refractory metals; and a second phase of a binder material selected from the group consisting of Co, Ni, Fe, and alloys thereof.